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SCIENCE

A WEEKLY JOURNAL DEVOTED TO THE ADVANCEMENT OF SCIENCE, PUBLISHING THE
OFFICIAL NOTICES AND PROCEEDINGS OF THE AMERICAN ASSOCIATION
FOR THE ADVANCEMENT OF SCIENCE.

FRIDAY, MAY 12, 1905.

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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

SECTION D, MECHANICAL SCIENCE AND ENGINEERING.

THE meetings were held in the engineering building of the University of Pennsylvania. The following officers were elected to serve during the meeting:

Councilor—F. W. McNair, president Michigan College of Mines, Houghton, Mich.

Member of the General Committee—H. S. Jacoby, professor of bridge engineering, Cornell University, Ithaca, N. Y.

Member of the Sectional Committee, 1905 to 1910—A. M. Greene, Jr., professor of mechanical engineering, University of Missouri, Columbia, Mo.

The secretary of the section was elected press secretary; vice-president and chairman of the section D. S. Jacobus, professor of experimental engineering, Stevens Institute, Hoboken, N. J., was forced to be absent, owing to illness in his family. The sectional committee appointed Calvin M. Woodward, ex-vice-president of the section, to act as chairman of the section for the meeting.

The program had been arranged so that papers pertaining to civil engineering, mechanical engineering, metallurgical engineering and general engineering, and to engineering education, should be read at separate sessions. The program of Wednesday morning, December 28, was devoted to civil engineering. The first paper on the program was by C. G. Elliott, expert in irrigation and drainage investigations of the Department of Agriculture, Washington, D. C., and was on 'Irrigation and Drainage Investigations of the Department contribution to our knowledge of the physical and geological conditions of the same section of the coast, as hitherto the only scientific studies of the Brazilian coral reefs were those of Hartt on the reefs near the Abrolhos and of Rathbun on that of Itaparica in the bay of Bahia. The coral reef-fringed section of the Brazilian coast extends from near the equator to 18° south latitude, but for nearly half of this long line, from Rio Grande do Norte northward, the various types of reef—sandstone, coral and underlying rock—can not at present be discriminated. The coral reefs are broken by many and large gaps, for some of which no apparent reason can be given. With the exception of the Rocas, which seems to be a true atoll rising from deep water, all the reefs are built up on the submerged continental shelf and are fringing and barrier reefs. They are usually narrow, ten to fifty meters in width, but in the case of the large barrier reefs may attain a width of thirty kilometers. The near-shore reefs are quite thin, probably not exceeding a thickness of ten meters, and a hundred meters is presumed to be the maximum thickness of the outlying barrier reefs.

For the most part the reefs have reached the upper limit of growth and are now dead on top, though still growing laterally. None, however, are known that have been elevated above tide level. In age they are presumed to date back to Tertiary times, since they rise from a shelf due to a great depression presumed to be of early Pliocene date. Coral rock has been observed both beneath and on top of sandstone reef rock and possibly some coral reefs rise from a base furnished by submerged examples of sandstone reefs. The coral polyp fauna found on the reefs contains twenty-eight species and is more closely related to that of the West Indies than to any other known coral fauna.

One of the points of greatest geological interest brought out by this study of the coral reefs is that a process of dolomitization of the reef rock is going on in the open sea, thus rendering unnecessary the 'salt-pan' hypothesis that has been appealed to in the cases hitherto noted of a higher proportion of magnesia in rocks of coral origin than in the skeletons of the corals themselves.

Dr. Branner states that the opportunity for completing his reef studies, commenced many years ago, was provided by Professor Alexander Agassiz. Both these gentlemen are, therefore, to be congratulated on the importance of the results achieved and presented in this splendid memoir, and it is greatly to be desired that these results will stimulate them to promote a similar study of that biologic and geologic *terra incognita,* the northern section of the reef-bound Brazilian coast, which, on account of the peculiar conditions of winds and currents, can only be explored by the use of steam vessels. ORVILLE A. DERBY.

COMMISSAO GEOGRAPHICA E GEOLOGICA DE
SÃO PAULO, BRAZIL,
December 26, 1904.

SCIENTIFIC JOURNALS AND ARTICLES.

THE April number (volume 11, number 7) of the *Bulletin of the American Mathematical Society* contains the following articles: Report of the February Meeting of the American Mathematical Society, by F. N. Cole; Report of the December Meeting of the Chicago Section, by T. F. Holgate; 'Mathematics at the St. Louis Congress, September 20, 22 and 24, 1904,' by H. S. White; 'The Use of Hypercomplex Numbers in Certain Problems of the Modular Group,' by J. W. Young; 'Extension of a Theorem due to Sylow,' by G. A. Miller; 'Note on Isothermal Curves and One-Parameter Groups of Conformal Transformations in the Plane,' by C. L. Bouton; Review of Arendt's Dirichlet's Definite Integrals, by Virgil Snyder; 'The Theta Functions' (Review of Krazer's Thetafunktionen and Rost's Riemann'sche Thetafunktionen), by J. I. Hutchinson; Review of Hilton's Mathematical Crystallography, by R. P. Baker; 'The Theory of Electricity' (Review of Abraham and Föpple's Theorie der Elektricität), by E. B. Wilson; Notes; New Publications.

THE April number (volume 6, number 2) of the *Transactions of the American Mathematical Society* contains the following papers:

E. J. WILCZYNSKI: 'General projective theory of space curves.'

MAURICE FRÉCHET: 'Sur les opérations linéaires (deuxième note).'

E. KASNER: 'Surfaces whose geodesics may be represented in the plane by parabolas.'

MAX MASON: 'The doubly periodic solutions of Poisson's equation in two independent variables.'

O. VEBLEN: 'Definition in terms of order alone in the linear continuum and in well-ordered sets.'

S. EPSTEEN and J. H. MACLAGAN-WEDDERBURN: 'On the structure of hypercomplex number systems.'

E. H. MOORE: 'On a definition of abstract groups.'

E. V. HUNTINGTON: 'Note on the definitions of abstract groups and fields by sets of independent postulates.'

L. E. DICKSON: 'Definitions of a group and a field by independent postulates.'

L. E. DICKSON: 'On semi-groups and the general isomorphism between finite groups.'

E. V. HUNTINGTON: 'A set of postulates for ordinary complex algebra.'

H. F. BLICHFELDT: 'On imprimitive linear homogeneous groups.'

SOCIETIES AND ACADEMIES.

THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE.

THE eleventh regular meeting of the Society for Experimental Biology and Medicine was held in the zoological laboratory of Columbia University, on Wednesday evening, April 19. The president, Edmund B. Wilson, was in the chair.

Members present.—Adler, Auer, Calkins, Emerson, Gies, Hatcher, Jackson, Lee, Levene, Levin, Lusk, Meltzer, Morgan, Murlin, Richards, Salant, Sherman, Torrey, Wallace, Wilson, Wolf, Yatsu.

Members elected.—Harlow Brooks, W. B. Cannon, A. J. Carlson, R. G. Harrison, A. P. Mathews, G. H. Parker, A. E. Taylor.

ABSTRACTS OF REPORTS OF ORIGINAL INVESTIGATIONS.*

The Relation Between Normal and Abnormal Development of the Frog's Egg: T. H. MORGAN.

The method of development of the frog's egg may be changed by a number of external conditions, *e. g.*, treatment with salt solutions of definite strengths, variations of temperature, deprivation of oxygen, treatment with carbon dioxid, subjection to 180 revolutions per minute, etc. The effects of such external agents are not gradual, *i. e.*, corresponding in degree to the increasing strength of the agent employed, for no effects appear up to a certain point, when suddenly the agent begins to act. Increasing the strength of the agent above this point increases the effect very slightly. The most plausible explanation of this mode of behavior in most of the cases is as follows: The agents act by coagulating certain parts of the egg, thereby preventing their further development. Other parts of the egg that are made up of different colloids or of different concentrations of colloid, remain unaffected, and proceed to carry out their development as far as the presence of the injured region allows.

The author referred particularly, however, to a second point of special interest: Despite the great diversity in the form of the abnormal embryos, most of them may be reduced to modifications of the same type. He stated that the abnormal embryo develops in the material of the upper hemisphere, while the normal embryo develops over the lower hemisphere. Two interpretations of this difference seem possible. Either the material is totipotent and an embryo may develop anywhere in the egg, appearing in the less injured regions; or the material for normal and abnormal development is the same and becomes carried downward, during the early stage of normal development, from the upper into the lower hemisphere. A test of these alternatives showed that when the two upper anterior blastomeres are removed, the head end of the embryo is defective; when the two upper posterior blastomeres are removed the posterior end sometimes shows defects. When all four of the upper blastomeres are removed no embryo develops, although the blastoporic rim may appear near the equator of the egg, the gastrulation process may begin and the dif-

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* The abstracts presented in this account of the proceedings have been greatly condensed from abstracts given to the secretary by the authors themselves. The latter abstracts of the reports may be found in current issues of *American Medicine* and *Medical News.*